

REMARKS

Claims 1-20, all the claims pending in the application, stand rejected on prior art grounds. Applicants respectfully traverse these rejections based on the following discussion.

I. The Prior Art Rejections

Claims 1-5, 8-12, and 15-18 stand rejected under 35 U.S.C. §102(b) as being anticipated by Fujii (U.S. Patent No. 5,574,280), hereinafter referred to as Fujii. Claims 7, 14, and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Fujii, in view of Berger, et al. (U.S. Publication No. 2004/0065826), hereinafter referred to as Berger. Claims 6, 13, and 19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Fujii, in view of Christy (U.S. Patent No. 3,119,707), hereinafter referred to as Christy. Applicants respectfully traverse these rejections based on the following discussion.

The claimed invention provides a method of inspecting topographical features of the top layer of a structure, wherein angled electron beams are directed toward the structure to cause precursor metal gas to form a metal coating. In the rejection, the Office Action argues that Fujii discloses a method of observing a sample surface using an electron beam and an inorganic metal gas to deposit a metal film on the sample surface. In addition, the Office Action argues that Berger discloses an imaging system comprising an electron beam oriented at angle between thirty and sixty degrees; and that Christy discloses an electron beam accelerated at 225 volts for forming a metal film. However,

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neither Fujii, Berger, nor Christy, individually or in combination, teach or suggest the use of secondary electron beams, which are created when angled electron beams strike topographical features, wherein the secondary electron beams break down precursor metal gas to form a metal coating. Rather, unlike Applicant's invention, Fujii discloses secondary *particles* formed by an *ion* beam, wherein the secondary particles are used to detect and image a sample. Therefore, as explained in further detail below, Applicant respectfully submits that the prior art of record does not teach or suggest the claimed invention.

The Office Action highlights Fujii's use of an electron beam to irradiate organic metal gas blown onto a sample surface, wherein a metal film is formed on the sample surface (column 2, lines 40-49). Moreover, Fujii explains in column 4, lines 34-45 that a predetermined area of the sample is removed by ion sputtering, wherein a cross-section of the sample is exposed. Fujii also discloses, in column 1, lines 7-12, 28-32, and column 4, lines 4-8, that secondary particles are utilized for imaging the sample surface. However, nothing in Fujii mentions using secondary electron beams, which are created from angled electron beams, for breaking down precursor metal gas to form a metal coating.

More specifically, unlike Applicant's invention, the "secondary *particles*" disclosed in Fujii are not created by an *electron* beam; rather, the particles in Fujii are created by an *ion* beam (column 1, lines 7-12, 28-32). Further unlike Applicant's invention, the secondary particles in Fujii are not used to form a metal coating. The secondary particles in Fujii are utilized to form an image of the sample, i.e., they are

detected by a detector to form an image of a section of the sample (column 1, lines 28-32, and column 4, lines 4-8).

The Office Action implies that the secondary particles in Fujii are generated when the electron beam irradiates the sample, wherein the secondary particles contribute to the disassociation of the organic gas, which results in the disposition of the metal coating onto the surface of the sample. Applicant respectfully disagrees with this conclusion. As discussed above, the secondary *particles* in Fujii are not created from an electron beam; rather they are formed from an ion beam (column 1, lines 7-12, 28-32). Further, the secondary particles are not utilized to form a metal coating – they are utilized to form an image of the sample (column 1, lines 28-32, and column 4, lines 4-8). Instead, the metal coating in Fujii is formed with the electron beam (which does not create secondary electron beams) and the inorganic metal gas (column 2, lines 40-49), wherein the method of Fujii is not concerned about damaging delicate components underlying the sample surface.

Conversely, as described in paragraph 39 of Applicant's disclosure, when the primary electron beam hits a surface, the emitted electrons that have an energy level less than 50 eV are called secondary electrons, and those with an energy level of 50 eV or higher are called backscattered electrons. The lower power secondary electrons are usually much more abundant relative to backscattered electrons. The same electron beam can be shared for both imaging and deposition, where the direct beam is used for imaging, and the indirect beam is used for metal deposition to form a true protection layer without deforming or damaging the underlying resist feature because of the nature of the

low energy of the indirect beam. The indirect electrons initiate the metal deposition (using the precursor gas). Thus, Applicant's invention provides the indirect electron beam as an energy source to initiate metal coating with the existence of precursor gas, and also offers a coating technique to cover a wide range applications on the variety of materials, topography, shapes, etc.

Therefore, contrary to the position taken in the Office Action, Applicant submits that Fujii does not teach or suggest the use of secondary electron beams, which are created when angled electron beams strike sidewalls of the topographical features, wherein the secondary electron beams break down precursor metal gas to form a metal coating. Thus, it is Applicant's position that Fujii does not disclose or suggest the claimed feature of "directing an angled electron beam at said structure to create secondary electron beams as said angled electron beam strikes sidewalls of said topographical features, wherein said secondary electron beams break down said precursor metal gas to form a metal coating on said structure" as defined by independent claim 1. Further, Fujii does not disclose or suggest the foregoing claimed feature wherein the "structure" is a "partially completed integrated circuit structure", as defined by independent claims 8 and 15, or wherein the "topographical features" are "vias", as defined by independent claim 15.

With respect to Berger, Applicant submits that this reference is introduced by the Office Action for the limited purpose of illustrating a method comprising the step of orienting an electron beam at angle between thirty and sixty degrees (as taught by claims 7, 14, and 20 of Applicant's invention). However, Berger does not discuss the creation

and use of secondary electron beams, nor does it mention forming a metal coating using precursor metal gas.

With respect to Christy, Applicant submits that this reference is introduced by the Office Action for the limited purpose of illustrating a method comprising the step of forming a metal film using an electron beam accelerated at 225 volts (as taught by claims 6, 13, and 19 of Applicant's invention). However, Christy does not disclose a method of inspecting topographical features of a structure, nor does Christy mention the creation and use of secondary electron beams.

Thus, it is Applicant's position that neither Berger nor Christy disclose or suggest the claimed feature of "directing an angled electron beam at said structure to create secondary electron beams as said angled electron beam strikes sidewalls of said topographical features, wherein said secondary electron beams break down said precursor metal gas to form a metal coating on said structure" as defined by independent claim 1. Further, neither Berger nor Christy disclose or suggest the foregoing claimed feature wherein the "structure" is a "partially completed integrated circuit structure", as defined by independent claims 8 and 15, or wherein the "topographical features" are "vias", as defined by independent claim 15. Furthermore, because independent claims 1, 8, and 15 are patentable over Berger and Christy, as illustrated above, the dependent claims that Berger and Christy were presented to reject, i.e., dependent claims 7, 14, 20, 6, 13, and 19, are patentable because of their dependency from patentable independent claims.

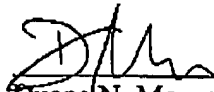
Therefore, it is Applicant's position that the proposed combination of Fujii and Berger or Christy, does not teach or suggest many features defined by independent claims

1, 8, and 15 and that such claims are patentable over the prior art of record. Further, it is Applicant's position that dependent claims 2-3, 5-7, 9-10, 12-14, and 16-20 are similarly patentable, not only because their dependency from patentable independent claims, but also because of the additional features of the invention they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

In view of the foregoing, Applicants submit that claims 1-3, 5-10, 12-20 are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time. Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 50-0510.

Respectfully submitted,

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